

SEQUENCE LISTING



<110> Kim, Sun-Young
Kim, Kee-Won
Kim, Tae-Han
Hwang, Jeong-Ho
Kim, Seon-Hee
Lee, Sun-Young

<120> Heterologous Protein Production System using Avian Cells

<140> US 09/029,042

<141> 1998-05-15

<150> PCT/KR96/00145

<151> 1996-08-23

<160> 11

<210> 1

<211> 1585

<212> DNA

<213> erythropoietin

<400> 1

atgggggtgc acgaatgtcc tgccctggctg ttgctttctcc tgcctctgct 50
gtcgtccct ctgggcctcc cagtcctggg cgcctccacca cgcctcatct 100
gtgacagccg agtcctggag aggtacctct tggaggccaa ggaggccgag 150
aatatcacgg tgagaccctc tcccagcac attccacaga actcacgctc 200
agggttcag ggaactcctc ccagatccag gaacctggca cttggtttgg 250
ggtggagtgg ggaagctaga cactgcccc ctacataaga ataagtctgg 300
tggcccaaaa ccatacctgg aaactaggca aggagcaaag ccagcagatc 350
ctacggcctg tgggccaggg ccagagcctt cagggaccct tgactccccg 400
ggctgtgtgc atttcagacg ggctgtgctg aacctgacg cttgaatgag 450
aatatcactg tcccagacac caaagttaat ttctatgcct ggaagaggat 500
ggaggtgagt tccttttttt ttttttttcc ttctttttgg agaattctcat 550
ttgcgagcct gattttggat gaaagggaga atgatcgagg gaaaggtaaa 600
atggagcagc agagatgagg ctgcctgggc gcagaggctc acgtctataa 650
tcccaggctg agatggccga gatgggagaa ttgcttgagc cctggagggt 700
cagaccaacc taggcagcat agtgagatcc cccatctcta caaacatata 750
aaaaaattag tcaggtgaag tgggtgatgg ttgtagtccc agatactgg 800
aaggctgagg cgggaggatc gcttgagccc aggaatttga ggctcagttg 850
agctgtgatc acaccactgc actccagcct cagtacaga gtgagccct 900
gtctcaaaaa agaaaagaaa aaagaaaat aatgagggt gtatggaata 950
cattcattat tcattcactc actcactcac tcattcattc attcattcat 1000

tcaacaagtc ttattgcata cttctgttt gctcagcttg gtgcttgggg 1050
 ctgctgaggg gcaggagggg gagggtgaca tgggtcagct gactcccaga 1100
 gtccactccc tctaggtcgg gcagcagggc gtagaagtct ggcagggcct 1150
 ggccctgctg tccgaagctg tccctgctgg ccaggccctg ttgggtcaact 1200
 cttcccagcc gtgggagccc ctgcagctgc atgtggataa agccgtcagt 1250
 ggccttcgca gcctcaccac tctgcttcgg gctctgggag cccaggtgag 1300
 taggagcgga cacttctgct tgccctttct gtaagaaggg gagaagggtc 1350
 ttgctaagga gtacaggaaac tgtccgtatt cttcccttt ctgtggcact 1400
 gcagcgacct cctgttttct ccttggcaga aggaagccat ctcccctcca 1450
 gatggcgctt cagctgctcc actccgaaca atcactgctg acactttccg 1500
 caaactcttc cgagcttact ccaatttctt ccggggaaaag ctgaagctgt 1550
 acacagggga ggctgcagg acaggggaca gatga 1585

<210> 2
 <211> 1533
 <212> DNA
 <213> erythropoietin
 <400> 2

atgggggtgc acgaatgtcc tgcctggctg tggcttctcc tgtccctgct 50
 gtcgtccct ctgggctcc cagtcctggg cgcaccacca cgcctcatct 100
 gtgacagccg agtcctggag aggtacctct tggaggccaa ggaggccgag 150
 aatatcacgg tgagaccct tcccagcac attccacaga actcacgctc 200
 agggcttcag ggaactcctc ccagatccag gaacctggca cttggtttgg 250
 ggtggagttg ggaagctaga cactgccccc ctacataaga ataagtctgg 300
 tggccccaaa ccatacctgg aaactaggca aggagcaaag ccagcagatc 350
 ctacgcctgt ggccagggcc agagccttca gggacccttg actccccggg 400
 ctgtgtgcat ttcagacggg ctgtgctgaa cactgcagct tgaatgagaa 450
 tatcactgtc ccagacacca aagttaattt ctatgcctgg aagaggatgg 500
 aggtgagttc cttttttttt ttttttctt tcttttggag aatctcattt 550
 gcgagcctga ttttgatga aagggagaat gatcgagga aaggtaaaat 600
 ggagcagcag agatgaggct gcctgggcgc agaggctcac gtctataatc 650
 ccaggctgag atggccgaga tgggagaatt gcttgagccc tggaggttca 700
 gaccaacctg ggcagcatag tgagatcccc catctctaca aacatttaaa 750
 aaaattagtc aggtgaagtg gtgcatggtg gtagtcccag atatttggaa 800
 ggctgaggcg ggaggatcgc ttgagcccag gaatttgagg ctgcagttag 850
 ctgtgatcac accactgcac tccagcctca gtgacagagt gaggcctgt 900
 ctcaaaaaag aaaagaaaaa agaaaaataa tgagggtgt atggaatacg 950
 ttcattatct attcactcac tcaactcact attcattcat tcattcattc 1000
 aacatgtctt attgcatacc ttctgtttgc tcagcttggg gcttgagagt 1050
 ccaactccctg taggtcgggc agcagggcgt agaagtctgg cagggcctgg 1100
 ccctgctgtc ggaagctgtc ctgctggggc aggcctgtt ggtcaactct 1150
 tcccagccgt gggagccctt gcagctgcat gtggataaag ccgtcagtgg 1200
 ccttcgcagc ctcaccactc tgcctggggc tctgggagcc caggtgagta 1250
 ggagcggaca cttctgcttg ccctttctgt aagaaggga gaagggtctt 1300
 gctaaggagt acaggaactg tccgtattcc ttccttttct gtggcactgc 1350

agcgacctcc tgttttctcc ttggcagaag gaagccatct cccctccaga 1400
 tgcggcctca gctgctccac tccgaacaat cactgctgac actttccgca 1450
 aactcttccg agtctactcc aatttctctc ggggaaagct gaagctgtac 1500
 acaggggagg cctgcaggac aggggacaga tga 1533

<210> 3

<211> 1585

<212> DNA

<213> erythropoietin

<400> 3

atgggggtgc acgaatgtcc tgcttggtg ttggtttctcc tgtccctgct 50
 gtcgctccct ctgggcctcc cagtccctgg cgccccacca cgcctcatct 100
 gtgacagccg agtcctggag aggtacctct tggaggccaa ggaggccgag 150
 aatatcacgg tgagaccctc tccccagcac attccacaga actcacgctc 200
 agggcttcag ggaactcctc ccagatccag gaacctggca cttgggttgg 250
 ggtggagttg ggaagctaga cactgcccc ctacataaga ataagtctgg 300
 tggccccaaa ccatacctgg aaactaggca aggagcaaag ccagcagatc 350
 ctacggcctg tgggccaggg ccaaacctt cagggaccct tgactccccg 400
 ggctgtttgc atttcagacg ggctgtgctg aacactgcag cttgaatgaa 450
 aatatcactg tcccagacac caaagttaat ttctatgcct ggaagaggat 500
 ggaggtgagt tccttttttt ttttttttcc tttcttttgg agaatctcat 550
 ttgcgagcct gattttggat gaaagggaga atgatcgagg gaaaggtaaa 600
 atggagcagc agagatgagg ctgcctgggc gcagaggctc acgtctataa 650
 tcccaggtcg agatggccga aatgggagaa ttgcttgagc cctggagggtt 700
 cagaccaacc taggcagcat agtgagatcc cccatctcta caaacattta 750
 aaaaaattag tcaggtgaag tgggtgcatg tggtagtccc agatatttgg 800
 atggctgagg cgggaggatc gcttgagccc aggaatttga ggctgcagtg 850
 agctgtgatc acaccactgc actccagcct cagtgcagca atgaggccct 900
 gtctcaaaaa agaaaagaaa aaagaaaaat aatgaggggt gtatggaata 950
 cattcattat tcattcactc actcactcac tcatccattc attcattcat 1000
 tcaacaagtc ttattgcata ccttctgttt gctcagcttg gtgctcgggg 1050
 ctgctgaggg gcaggaggga gaggtgaca tgggtcagct gactcccaga 1100
 gtccactccc tgtaggtcgg gcaacaggcc gtagaagtct ggcagggcct 1150
 ggccctgctg tcggaagctg tcctgcgggg ccaggccctg ttggtcaact 1200
 tttcccagcc gtgggagccc ctgcagctgc atgtggataa agccgtcagt 1250
 ggccttcgca gcctcaccac tctgcttcgg gctctgggag cccagggtgag 1300
 taggagcgga cacttctgct tgccctttct gtaagaaggg gagaagggtc 1350
 ttgctaagga gtacaggaac tgtccgtatt ccttcccttt ctgtggcact 1400
 gcagcgacct cctgttttct ccttggcaga aggaagccat ctccccctca 1450
 gatgcggcct cagctgctcc actccgaaca atcactgctg acactttccg 1500
 caaactcttc cgagtctact ccaatttctc ccggggaaag ctgaagctgt 1550
 acacagggga ggctgcagg acaggggaca gatga 1585

<210> 4

<211> 1586

<212> DNA

<213> erythropoietin

<400> 4

atgggggtgc acgaatgtcc tgcctggctg tggcttctcc tgtccctgct 50
gtcgctccct ctgggectcc cagtcctggg cgccccacca cgcctcatct 100
gtgacagccg agtcctggag aggtacctct tggaggccaa ggaggccgag 150
aatatcacgg tgagaccctt tccccagcac attccacaga actcacgctc 200
agggcttcag ggaactcctc ccagatccag gaacctggca cttggtttgg 250
ggtggagtgt ggaagctaga cactgcccc ctacataaga ataagtctgg 300
tggccccaaa ccatacctgg aaactaggca aggagcaaag ccagcagatc 350
ctacggcctg tgggccaggg ccaggagcct tcagggacct ttgactcccc 400
gggctgtgtg catttcagaa gggctgtgct gaacactgca gcttgaatga 450
gaatatcact gtcccagaca ccaaagttaa tttctatgcc tggaagagga 500
tggaggtgag ttcccttttt tttttttt ctttcttttg gagaatctca 550
tttgcgagcc tgattttgga tgaaaggag agtgatcgag ggaaaggtaa 600
aatggagcag cagagatgag gctgcctggg cgcagaggct cactctata 650
atcccaggct gagatggccg agatgggaga attgcttgag ccctggagggt 700
tcagaccaac ctaggcagca tagtgagatc ccccatctct acaaacattt 750
aaaaaaatta gtcaggtgaa gtggtgcatg gtggtagtcc cagatatttg 800
gaaggctgag gcgggaggat cgcttgagcc caggaatttg aggctgcgggt 850
gagctgtgat cacaccactg cactccagcc tcagtgcag agtgaggccc 900
tgtctcaaaa aagaaaagaa aaaagaaaaa taatgagggc tgtatggaat 950
acattcatta ttcattcact cactcactca ctctcattt cattcattca 1000
ttcaacaagt cttattgcat accttctgtt tgctcagctt ggtgcttggg 1050
gctgctgagg ggcaggaggg tgagggtgac atgggtcagc tgactcccag 1100
agtccactcc ctgttggtcg ggcagcaggc cgtagaagtc tggcagggcc 1150
tggcctgct gtcggaagct gtccctgcgg gccaggccct gttggtcaac 1200
tcttcccagc cgtgggagcc cctgcagctg catgtggata aagccgtcag 1250
tggccttcgc agcctcacca ctctgcttcg ggctctggga gccaggtga 1300
gtaggagcgg acacttctgc ttgccctttc tgtaagaagg ggagaagggt 1350
cttgctaagg agtacaggaa ctgtccgtat tccctccctt tctgtggcac 1400
tgcagcgacc tcctgttttc tccttggcag aaggaagcca tctccctcc 1450
agatgcggcc tcagctgctc cactccgaac aatcactgct gacactttcc 1500
gcaaactctt ccgagtctac tccaatttcc tccggggaaa gctgaagctg 1550
tacacagggg aggcctgcag gacaggggac agatga 1586

<210> 5

<211> 1583

<212> DNA

<213> erythropoietin

<400> 5

atgggggtgc acgaatgtcc tgcctggetg tggcttctcc tgtccctgct 50
gtcgctccct ctgggcctcc cagtcctggg cgcaccacca cgcctcatct 100
gtgacagacg agtcctggag aggtacctct tggaggccaa ggaggccgag 150
aatatcacgg tgagaccctc tccccagcac attccacaga actcacgctc 200
agggcttcag ggaactcctc ccagatccag gaacctggca cttggtttg 250
ggtggagtgg ggaagctaga cactgcccc ctacataaga ataagtctgg 300
tggcccaaaa ccatacctgg aaactaggca aggagcaaag ccagcagatc 350
ctacggcctg tggcccaggg gcagagcctt cagggaccct tgactccccg 400
ggctgtgtgc atttcagacg ggctgtgtctg aacactgcag cttgaatgag 450
aatatcactg tcccagacac caaagttaat ttctatgcct ggaagaggat 500
ggaggtgagt tctttttttt ttttttctt tcttttgag aatctcattt 550
gcgagcctga ttttgatga aaggggagaat gatcgaggga aaggtaaaat 600
ggagcagcag agatgaggct gcctggggcg agaggctcac gtctataatc 650
ccaggctgag acggccgaga tgggagaatt gcttgagccc tggaggttca 700
gaccaacctg ggcagcatag tgagatcccc catctctaca aacattttaa 750
aaaattagtc aggtgaagtg gtgcatgggtg gtagtcccag atatttgaa 800
ggctgaggcg ggaggatcg ttagcccgag gaatttggg ctgcagttag 850
ctgtgatcac accactgcaa tccagcctca gtgacagagt gaggccctgt 900
ctcaaaaacg aaaagaaaaa agaaaaataa tgagggtgt atggaataca 950
ttcattattc attcactcac tcaactcactc attcattcat tcattcattc 1000
aacaagtctt attgcatacc ttctgtttgc tcagcttggg gcttgggcct 1050
tctgaggggc agggaggaga ggggtgacatg ggtcagctga ctcccagagt 1100
ccactccctg taggtcgggc agcaggccgt agaagtctgg cagggcctgg 1150
ccctgctgtc ggaatctgtc ctgcggggcc aggccctgtt ggtcaactct 1200
tccaaccgt gggagccctc gcagctgcat gtggataaag ccgtcagtg 1250
ccttcgcagc ctccaccactc tgcttcggggc tctgggagcc cagttgagta 1300
ggaggggaca cttctgcttg ccctttgtgt aagaaggaga gaagggtctt 1350
gctaaggagt acaggaactg tccgtattcc ttccctttct gtggcactgc 1400
agcgacctcc tgttttctcc ttggcagaag gaagccatct cccctccaga 1450
tgcgccctca gctgctccac tccgaacaat cactgctgat actttccgca 1500
aactcttccg agtctactcc aatttctctc ggggaaagct gaagctgtac 1550
acaggggagc cctgcaggac aggggacaga tga 1583

<210> 6

<211> 1587

<212> DNA

<213> erythropoietin

<400> 6

atgggggtgc acgaatgtcc tgcctggetg tggcttctcc tgtccctgct 50
gtcgctccct ctgggcctcc cagtcctggg cgcaccacca cgcctcatct 100
gtgacagccg agtcctggag aggtacctct tggaggccaa ggaggccgag 150
aatatcacgg tgagaccctc tccccagcac attccacaga actcacgctc 200

agggcttcag gggaactcct cccaggatcc aggaacctgg cacttggttt 250
 ggggtggagt tgggaagcta gacactgccc ccctacataa gaataagtct 300
 ggtggcccca aaccatacct ggaaactagg caaggagcaa agccagcaga 350
 tcctacggcc tgtggcccag ggccagagcc ttcagggacc cttgactccc 400
 cgggctgtgt gcattccaga cgggctgtgc tgaacactgc agcttgaatg 450
 agaatatcac tgtcccagac accaaagtta atttctatgc ctggaagagg 500
 atggaggatga gttccttttt tttttttttt cctttctttt ggagaatctc 550
 atttgcgagc ctgatttggg atgaaaggga gaatgatcga gggaaaggta 600
 aaatggagca gcagagatga ggctgcctgg gcgcagaggc tccagtctat 650
 aatcccaggc tgagatggcc gagatgggag aattgcttga gccctggagg 700
 ttcagaccaa cctaggcagc ctagtggatg ccccatctc tacaacatt 750
 taaaaaaatt agtcaggatga agtggtgcat ggtggtagtc ccagatattt 800
 ggaaggctga ggccgggagga tcgcttgagc ccaggaattt gaggctgcag 850
 tgagctgtga tcacaccact gcaactccagc ctcagtgcga gagtgaggcc 900
 ctgtctcaaa aaagaaaaga aaaaagaaaa attatgaggg ctgtatggaa 950
 tacattcatt attcattcac tcaactcact actcattcat tcattcattc 1000
 attcaacaag tcttattgca taccttctgt ttgctcagct tgggtgcttg 1050
 ggctgctgag gggcaggagg gagagggtga catgggtcaa ctgactccca 1100
 gagtccactc cctgtaggtc gggcagcagg ccgtagaagt ctggcagggc 1150
 ctggccctgc tgtcggaagc tgtcctgcgg ggccaggccc tgttggtcaa 1200
 ctcttcccag ccgtgggagc ccctgcagct gcatgtggat aaagccgtca 1250
 gtggccttcg cagcctcacc actctgcttc gggctctggg agcccagggtg 1300
 agtaggagcg gacacttctg cttgcccttt ctgtaagaag gggagaaggg 1350
 tcttgctaag gagtacagga tctgtccgta ttccttccct ttctgtggca 1400
 ctgcagcgac cacctgtttt ctcttgga gaaggaagcc atctccctc 1450
 cagatgcggc ctcagctgct ccactccgaa caatcactgc tgacactttc 1500
 cgcaaaactc tccgagtcta ctccaatttc ctccggggag agctgaagct 1550
 gtacacaggg gaggcctgca ggacagggga cggatga 1587

<210> 7

<211> 193

<212> PRT

<213> erythropoietin gene

<400> 7

Met Gly Val His Glu Cys Pro Ala Trp Leu Trp Leu Leu Leu Ser Leu
 1 5 10 15
 Leu Ser Leu Pro Leu Gly Leu Pro Val Leu Gly Ala Pro Pro Arg Leu
 20 25 30
 Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu Leu Glu Ala Lys Glu
 35 40 45
 Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His Cys Ser Leu Asn Glu
 50 55 60
 Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe Tyr Ala Trp Lys Arg
 65 70 75 80

Met Glu Val Gly Gln Gln Ala Val Glu Val Trp Gln Gly Leu Ala Leu 95
 85
 Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu Leu Val Asn Ser Ser 110
 100 105
 Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp Lys Ala Val Ser Gly 125
 115 120
 Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu Gly Ala Gln Lys Glu 140
 130 135
 Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala Pro Leu Arg Thr Ile 160
 145 150 155
 Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val Val Ser Asn Phe Leu 175
 165 170
 Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala Cys Arg Thr Gly Asp 190
 180 185

Arg

<210> 8

<211> 193

<212> PRT

<213> erythropoietin gene

<400> 8

Met Gly Val His Glu Cys Pro Ala Trp Leu Trp Leu Leu Leu Ser Leu 15
 1 5 10
 Leu Ser Leu Pro Leu Gly Leu Pro Val Leu Gly Ala Pro Pro Arg Leu 30
 20 25
 Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu Leu Glu Ala Lys Glu 45
 35 40
 Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His Cys Ser Leu Asn Glu 60
 50 55
 Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe Tyr Ala Trp Lys Arg 80
 65 70 75
 Met Glu Val Gly Gln Gln Ala Val Glu Val Trp Gln Gly Leu Ala Leu 95
 85 90
 Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu Leu Val Asn Ser Ser 110
 100 105
 Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp Lys Ala Val Ser Gly 125
 115 120
 Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu Gly Ala Gln Lys Glu 140
 130 135
 Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala Pro Leu Arg Thr Ile 160
 145 150 155
 Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val Val Ser Asn Phe Leu 175
 165 170
 Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala Cys Arg Thr Gly Asp 190
 180 185

Arg

<210> 9

<211> 193

<212> PRT

<213> erythropoietin gene

<400> 9

Met Gly Val His Glu Cys Pro Ala Trp Leu Trp Leu Leu Leu Ser Leu
1 5 10 15
Leu Ser Leu Pro Leu Gly Leu Pro Val Leu Gly Ala Pro Pro Arg Leu
20 25 30
Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu Leu Glu Ala Lys Glu
35 40 45
Ala Glu Asn Ile Thr Lys Gly Cys Ala Glu His Cys Ser Leu Asn Glu
50 55 60
Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe Tyr Ala Trp Lys Arg
65 70 75 80
Met Glu Val Gly Gln Gln Ala Val Glu Val Trp Gln Gly Leu Ala Leu
85 90 95
Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu Leu Val Asn Ser Ser
100 105 110
Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp Lys Ala Val Ser Gly
115 120 125
Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu Gly Ala Gln Lys Glu
130 135 140
Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala Pro Leu Arg Thr Ile
145 150 155 160
Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val Tyr Ser Asn Phe Leu
165 170 175
Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala Cys Arg Thr Gly Asp
180 185 190
Arg

<210> 10

<211> 193

<212> PRT

<213> erythropoietin gene

<400> 10

Met Gly Val His Glu Cys Pro Ala Trp Leu Trp Leu Leu Leu Ser Leu
 1 5 10 15
 Leu Ser Leu Pro Leu Gly Leu Pro Val Leu Gly Ala Pro Pro Arg Leu
 20 25 30
 Ile Cys Asp Arg Arg Val Leu Glu Arg Tyr Leu Leu Glu Ala Lys Glu
 35 40 45
 Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His Cys Ser Leu Asn Glu
 50 55 60
 Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe Tyr Ala Trp Lys Arg
 65 70 75 80
 Met Glu Val Gly Gln Gln Ala Val Glu Val Trp Gln Gly Leu Ala Leu
 85 90 95
 Leu Ser Glu Ser Val Leu Arg Gly Gln Ala Leu Leu Val Asn Ser Ser
 100 105 110
 Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp Lys Ala Val Ser Gly
 115 120 125
 Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu Gly Ala Gln Lys Glu
 130 135 140
 Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala Pro Leu Arg Thr Ile
 145 150 155 160
 Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val Tyr Ser Asn Phe Leu
 165 170 175
 Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala Cys Arg Thr Gly Asp
 180 185 190
 Arg

<210> 11
 <211> 193
 <212> PRT
 <213> erythropoietin gene
 <400> 11

Met Gly Val His Glu Cys Pro Ala Trp Leu Trp Leu Leu Leu Ser Leu
 1 5 10 15
 Leu Ser Leu Pro Leu Gly Leu Pro Val Leu Gly Ala Pro Pro Arg Leu
 20 25 30
 Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu Leu Glu Ala Lys Glu
 35 40 45
 Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His Cys Ser Leu Asn Glu
 50 55 60
 Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe Tyr Ala Trp Lys Arg
 65 70 75 80
 Met Glu Val Gly Gln Gln Ala Val Glu Val Trp Gln Gly Leu Ala Leu
 85 90 95
 Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu Leu Val Asn Ser Ser
 100 105 110

*See
34
included*

Gln	Pro	Trp	Glu	Pro	Leu	Gln	Leu	His	Val	Asp	Lys	Ala	Val	Ser	Gly
			115				120					125			
Leu	Arg	Ser	Leu	Thr	Thr	Leu	Leu	Arg	Ala	Leu	Gly	Ala	Gln	Lys	Glu
	130					135					140				
Ala	Ile	Ser	Pro	Pro	Asp	Ala	Ala	Ser	Ala	Ala	Pro	Leu	Arg	Thr	Ile
145					150					155					160
Thr	Ala	Asp	Thr	Phe	Arg	Lys	Leu	Phe	Arg	Val	Tyr	Ser	Asn	Phe	Leu
				165					170					175	
Arg	Gly	Glu	Leu	Lys	Leu	Tyr	Thr	Gly	Glu	Ala	Cys	Arg	Thr	Gly	Asp
			180					185					190		
Gly															

*D
coord.*